

--A process for synthesizing photocurable poly(ethynyl)carbosilane includes the steps of forming a dispersion of sub-stoichiometric amounts of alkali metal, adding dichlorosilane and trichlorosilane reagents and adding excess sodium acetylide.--

--A process for synthesizing photocurable poly(ethynyl)carbosilane includes the steps of forming a dispersion of sub-stoichiometric amounts of molten sodium metal in a solvent, adding dichlorosilane and trichlorosilane reagents and adding excess sodium acetylide.--

181 --A process for synthesizing photocurable poly(ethynyl)carbosilane includes the steps of forming a dispersion of sub-stoichiometric amounts of molten sodium metal in a solvent, adding dichloromethylsilane and trichlorophenylsilane reagents and adding excess sodium acetylide in dimethylbromide.--

--A process for synthesizing photocurable poly(ethynyl)carbosilane includes the steps of forming a dispersion of sub-stoichiometric amounts of molten sodium metal in xylene, adding dichloromethylsilane and trichlorophenylsilane reagents and adding excess sodium acetylide in dimethylbromide.--

--A process for synthesizing photocurable poly-(ethynyl)carbosilane includes the steps of forming a dispersion of sub-stoichiometric amounts of molten sodium metal in xylene, adding dichloromethylsilane and trichlorophenylsilane reagents, filtrating insoluble by-products, evaporating xylene solvent from poly(chloro)-carbosilane polymer, dissolving said aforementioned polymer in tetrahydro furan and adding excess sodium acetylide dissolved in dimethyl bromide.--

--A process of forming a photo-curable pre-ceramic polymer, poly(ethynyl)-carbosilane to silicon carbide ceramic includes the steps of reacting sodium acetylide with organo-chlorosilanes and condensing (polymerizing) the resultant organo-(ethynyl)chlorosilane product of step a with an excess of an alkali metal.--

B.1 --A process of forming a photo-curable pre-ceramic polymer, poly(ethynyl)-carbosilane to silicon carbide ceramic includes the steps of reacting sodium acetylide with organochloro-silanes and condensing (polymerizing) the resultant organoethynyl)chlorosilane product of step a with an excess of an alkali metal sodium.--

--A process of forming a photo-curable pre-ceramic polymer, poly(ethynyl)-carbosilane, to silicon carbide ceramic includes the steps of reacting sodium acetylide

with a mixture of organodichloro-silanes and organotri-chlorosilanes and condensing (polymerizing) the resultant organo (ethynyl)-chlorosilane product of step a with an excess of an alkali metal.

--A process in which the organochlorosilane is selected from a group of one or more of the following: dichlorodimethylsilane, trichloro-phenylsilane (tri-functional) and methyltrichlorosilane.--

--A process of forming a photo-curable pre-ceramic polymer, poly(ethynyl)-carbosilane to silicon carbide ceramic includes the steps of reacting a sub-stoichiometric amount of an alkali metal with organochloro-silanes and reacting the partially polymerized polyorganochlorosilane with sodium acetylide.--

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--A process of forming a photo-curable pre-ceramic polymer, poly(ethynyl)-carbosilane to silicon carbide ceramic includes the steps of reacting a sub-stoichiometric amount of sodium metal with organochlorosilanes and reacting the partially polymerized polyorganochlorosilane with sodium acetylide.--

--A process of forming a photo-curable pre-ceramic polymer, poly(ethynyl)carbosilane to silicon carbide ceramic includes the steps of reacting a sub-stoichiometric amount of an alkali metal with a mixture of organodichloro-

silanes and organotrichlorosilanes and reacting the partially polymerized polyorgano-chlorosilane with sodium acetylide.--

--A process in which the organochlorosilane is selected from a group consisting of one or more of the following: dichlorodimethylsilane, trichlorophenylsilane (tri-functional), and methyltrichlorosilane.--

--A process of forming a photo-curable pre-ceramic polymer, poly(ethynyl)silazane, to silicon nitride ceramic includes the steps of reacting sodium acetylide with organochlorosilanes and condensing (polymerizing) the resultant organo(ethynyl)chlorosilane product of step a with ammonia.--

B1 --A process of forming a photo-curable pre-ceramic polymer, poly(ethynyl)-silazane to silicon nitride ceramic includes the steps of reacting sodium acetylide with organochlorosilanes and condensing (polymerizing) the resultant organo(ethynyl) chlorosilane product of step a with ammonia.--

--The process of preparing photocurable CERASETTM SZ inorganic polymer includes the step adding a photo-initiator to CERASETTM SZ inorganic polymer.--

--The process in which said photo-initiator is Camphorquinone.--

--The process in which said photo-initiator is
IRGACURE® 1800.--

--The process of preparing photocurable allylhydrido-
polycarbosilane polymer includes the step of adding a
photo-initiator to allylhydridopolycarbosilane polymer.--

--The process in which said photo-initiator is
Camphorquinone.--

--The process in which said photo-initiator is
IRGACURE® 1800.--

--A process of forming a photo-curable pre-ceramic
polymer, poly(ethynyl)silazane, to silicon nitride ceramic
includes the steps of reacting sodium acetylide with a
mixture of organo-dichlorosilanes and organotrichloro-
silanes and condensing (polymerizing) the resultant organo-
ethynyl)chloro-silane product of step a with ammonia.--

B) --A process in which the organochlorosilane is
selected from a group consisting of one or more of the
following: dichlorodimethylsilane, trichlorophenylsilane
(tri-functional) and methyltri chlorosilane.--

--A process of forming a photo-curable pre-ceramic
polymer, poly(ethynyl)-silazane to silicon nitride ceramic
includes the steps of reacting a sub-stoichiometric amount
of ammonia with organo-chlorosilanes and reacting the

partially polymerized polyorgano chlorosilazane with sodium acetylide.--

--A process of forming a photo-curable pre-ceramic polymer, poly(ethynyl)silazane to silicon nitride ceramic includes the steps of reacting a sub-stoichiometric amount of ammonia with organo-chloro-silanes and reacting the partially polymerized polyorgano chlorosilazane with sodium acetylide.--

--A process of forming a photo- curable pre-ceramic polymer, poly(ethynyl)-silazane to silicon nitride ceramic includes the steps of reacting a sub-stoichiometric amount of ammonia with with a mixture of organodichlorosilanes and organotrichlorosilanes and reacting the partially polymerized polyorganoc hlorosilazane with sodium acetylide.--

19) --A process for fabricating a ceramic matrix composites includes the steps of preparing a solution of thermoplastic photo-curable pre-ceramic polymer, passing a pre-preg through said solution of thermo- plastic photo-curable pre-ceramic polymer, applying said pre-preg to a shaped mandrel, using light energy to induce cross-linking of said photo-curable pre-ceramic polymer after application to said mandrel whereby said thermoplastic pre-ceramic polymer is curved and

pyrolyzing said cured thermoplastic pre-ceramic polymer matrix composite material.--

--A single-step fabrication of continuous ceramic fiber ceramic matrix composites employing a thermoplastic photo-curable pre-ceramic polymer in which the component is shape by a variety of standard composite fabrication techniques, such as filament winding, tape winding, and woven cloth winding includes steps of passing ceramic fiber monofilament, tow, mat, or woven cloth through a solution of said thermoplastic photo-curable pre-ceramic polymer, applying ceramic fiber monofilament, tow, mat, or woven cloth to a shaped mandrel, using photo-energy of the ultraviolet, visible or infrared light spectrum to induce cross-linking (curing) of the photo-curable pre-ceramic polymer after application to said mandrel and either partially or completely pyrolyzing the now cured pre-ceramic polymer matrix composite material.--

--A process for synthesizing ceramic matrix composites in which the pre-ceramic polymer is poly(ethynyl)carbo-silane.--

--A process for synthesizing ceramic matrix composites in which the pre-ceramic polymer yields silicon carbide upon pyrolysis.--

--A process for synthesizing ceramic matrix composites in which the pre-ceramic polymer yields an oxide ceramic upon pyrolysis.--

--A process for synthesizing ceramic matrix composites in which the pre-ceramic polymer yields titanium carbide upon pyrolysis.

--A process for synthesizing ceramic matrix composites in which the pre-ceramic polymer yields aluminum nitride upon pyrolysis.--

--A process for synthesizing ceramic matrix composites in which the pre-ceramic polymer yields silicon nitride upon pyrolysis.--

--A process for synthesizing ceramic matrix composites in which the pre-ceramic polymer yields aluminum oxide upon pyrolysis.--

b) --Single-step fabrication of continuous ceramic fiber ceramic matrix composites employing a thermoplastic photo-curable pre-ceramic polymer in which the component is shape by a variety of standard composite fabrication techniques, such as filament winding, tape winding, and woven cloth winding under inert atmosphere includes steps of passing ceramic fiber monofilament, tow, mat, or woven cloth through a solution of said thermoplastic photo-curable pre-ceramic polymer, applying ceramic fiber

monofilament, tow, mat, or woven cloth to a shaped rotating mandrel, use of a heated or unheated compaction roller to press the thermoplastic pre-ceramic polymer onto the mandrel, using ultraviolet, visible, or infrared light to induce cross-linking (curing) of the photo-curable pre-ceramic polymer thereby rendering a thermoset polymer, either partially or completely pyrolyzing the now cured pre-ceramic polymer matrix material and followed by the final heat treatment of the shaped ceramic matrix composite "brown body".--

--A process for synthesizing ceramic matrix composites in which the pre-ceramic polymer is poly(ethynyl)carbo-silane.--

--A process for synthesizing ceramic matrix composites in which the pre-ceramic polymer yields an oxide ceramic upon pyrolysis.--

101 --A process for synthesizing ceramic matrix composites in which the pre-ceramic polymer yields silicon nitride upon pyrolysis.--

--A process for synthesizing ceramic matrix composites in which the pre-ceramic polymer yields titanium carbide upon pyrolysis.--

--A process for synthesizing ceramic matrix composites in which the pre-ceramic polymer yields aluminum nitride upon pyrolysis.--

--A process for synthesizing ceramic matrix composites in which the pre-ceramic polymer yields silicon carbide upon pyrolysis.--

--A process for synthesizing ceramic matrix composites in which the pre-ceramic polymer yields aluminum oxide upon pyrolysis.--

--Single-step fabrication of continuous ceramic fiber ceramic matrix composites employing a thermoplastic photo-curable pre-ceramic polymer in which the component is shape by a variety of standard composite fabrication techniques, such as filament winding, tape winding, and woven cloth winding, includes steps of passing ceramic fiber monofilament, tow, mat, or woven cloth through a solution of said thermoplastic photo-curable pre-ceramic polymer, applying ceramic fiber monofilament, tow, mat, or woven cloth to a moving flat substrate, using a compaction roller to press the thermoplastic pre-ceramic polymer coated ceramic fiber onto flat substrate, using photo-light of the ultraviolet, visible, or infrared light spectrum to induce cross-linking curing) of the photo-curable pre-ceramic polymer thereby rendering a thermoset polymer

and either partially or completely pyrolyzing the now cured pre-ceramic polymer matrix coated ceramic fiber material.--

--A process for synthesizing ceramic matrix composites 999 50 in which the pre-ceramic polymer is poly(ethynyl)carbo- silane.--

--A process for synthesizing ceramic matrix composites in which the pre-ceramic polymer yields an oxide ceramic upon pyrolysis.--

--A process for synthesizing ceramic matrix composites in which the pre-ceramic polymer yields silicon nitride upon pyrolysis.--

--A process for synthesizing ceramic matrix composites in which the pre-ceramic polymer yields titanium carbide upon pyrolysis.--

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--A process for synthesizing ceramic matrix composites in which the pre-ceramic polymer yields aluminum nitride upon pyrolysis.--

--A process for synthesizing ceramic matrix composites in which the pre-ceramic polymer yields silicon carbide upon pyrolysis.--

--A process for synthesizing ceramic matrix composites in which the pre-ceramic polymer yields aluminum oxide upon pyrolysis.
